may be allowed to point out that the fact mentioned by Prof. Virchow favours rather than disproves this view. If the plain between Hissarlik and the sea has been gradually formed by the detritus brought down by Scamander the materials would be of fresh-water origin. The observations made by Dr. Virchow appear therefore to me by no means to bear out the conclusions which it is said have been drawn from them.

15, Lombard Street, E.C., July 12 JOHN LUBBOCK

On the Origin of Certain Granitoid Rocks

DR. HICKS has very properly called attention to his prior discovery of the transitional nature of some hälleflintas, and I regret that I overlooked this point in his valuable papers on the Pembrokeshire rocks. I may, however, be permitted to point out that my observations in Shropshire go further than those of Dr. Hicks, since the hälleflinta observed in the Wrekin range passes not merely into "incipient gneiss, the metamorphic action being incomplete, a kind of semi-metamorphism and softening having taken place, etc."; but into a true gneiss, distinctly foliated in bands of quartz, felspar, mica, and sometimes hornblende, and into granitoidite and granite. In the Wrekin we see the completion of the change of which Dr. Hicks recorded the earlier stages. C. CALLAWAY

Wellington, Salop, July 12

The Telephone

EXPERIMENTS that I have recently made with a "Bell" telephone have convinced me that the sounds produced are the result of molecular change in the iron disk, and are the same in kind as those heard in the telephone of Reiss.

My experiments were made with a carbon transmitter and Bell receiver, using a small battery to generate the current. First I removed the bar magnet from the receiver, in accordance with a suggestion made by a writer in NATURE some months ago. The effect without the magnet was the same as with it. It then occurred to me that the intensity of the sound might be increased by using two disks instead of one. Accordingly I cut two circles out of a piece of sheet iron, leaving a narrow strip of the metal to connect them, of sufficient length to enable the disks to lie on either side of the reel, so as to form, in fact, an armature to the electro-magnet. On experimenting with this my anticipations were fully realised, the sound produced being more than double that from a single disk.

Now, while trying these experiments I held the disks loosely in my hand, without their being in any way fastened to the wood holding the reel, the effect being the same as if firmly secured. In fact, a common dinner knife or a rough piece of iron would emit sound if brought near enough to the core of the electro-magnet.

I have since constructed a very efficient telephone receiver out of a block of wood two inches square and three-quarters of an inch thick. I then drilled a hole sufficiently large to receive the reel, and covered the block with thin sheet iron. It needs no ear-piece, and forms the most effective telephone receiver that I have seen. But, still further to prove that the sounds produced are due to the magnetisation of the iron of the disk, and not to mechanical vibrations resulting from the electro-magnet, I made an iron reel, the flanges of which were two inches in diameter. Now, on covering this reel and placing it in circuit, the flanges of the reel gave out sound as clearly as in the Bell telephone. In my judgment this experiment renders it conclusive that the sounds proceed from the magnetisation and demagnetisation of the iron, and are therefore precisely the same in character as those formed by a Reiss receiver.

PERCIVAL JENNS

St. John's Rectory, British Columbia

Inherited Memory in Birds

SOME interesting communications have lately appeared in NATURE on this subject, accounting for the wonderful knowledge of routes and localities displayed by birds in their migrations, by the theory that the impressions made on the brains of the parents are transmitted to their offspring, and that which we call vaguely instinct is often inherited memory.

The following circumstance is hard to explain on any other theory:—

About twelve years ago I was residing on the coast of Co. Antrim, at the time the telegraph wires were set up along that charming road which skirts the sea for twenty-five miles between Larne and Cushendall. During the winter months large flocks of starlings always migrated over from Scotland, arriving in the early morning. The first winter after the wires were stretched along the coast I frequently found numbers of starlings lying dead or wounded on the roadside, they having evidently in their flight in the dusky morn struck against the telegraph wires, not blown against them, as these accidents often occurred when there was but little wind. I found that the peasantry had come to the conclusion that these unusual deaths were due to the flash of the telegraph messages, killing any starlings that happened to be perched on the wires when working.

Strange to say, that throughout the following and succeeding winters hardly a death occurred among the starlings on their arrival. It would thus appear that the birds were deeply impressed and understood the cause of the fatal accidents among their fellow-travellers that previous year, and hence carefully avoided the telegraph wires; not only so, but the young birds must also have acquired this knowledge and perpetuated it, a knowledge which they could not have acquired by experience or even instinct, unless the instinct was really inherited memory derived from the parents whose brains were first impressed by it.

Sudbury, Suffolk J. SINCLAIR HOLDEN

Butterfly Swarms

SOME, at least, of the swarms of *V. cardui* originate in Africa, one of which I witnessed a day's march west of Sowakin, in Nubia, in March, 1869. Our caravan had started for the coast, leaving the mountains shrouded in heavy clouds, soon after daybreak. At the foot of the high country is a stretch of wiry grass, beyond which lies the rainless desert as far as the sea. From my camel I noticed that the whole mass of the grass seemed violently agitated, although there was no wind. On dismounting I found that the motion was caused by the contortions of pupæ of *V. cardui*, which were so numerous that almost every blade of grass seemed to bear one. The effect of these wrigglings was most peculiar, as if each grass stem was shaken separately—as indeed was the case—instead of bending regularly before a breeze. I called the attention of the late J. K. Lord to the phenomenon, and we awaited the result. Presently the pupæ began to burst, and the red fluid that escaped sprinkled the ground like a rain of blood. Myriads of butterflies limp and helpless crawled about. Presently the sun shone forth, and the insects began to dry their wings; and about half-an-hour after the birth of the first, the whole swarm rose as a dense cloud and flew away eastwards towards the sea. I do not know how long the swarm was, but it was certainly more than a mile, and its breadth exceeded a quarter of a mile.

SYDNEY B. J. SKERTCHLY

Distribution of the Black Rat

FROM Prof. Giglioli's letter in NATURE, vol. xx. p. 242, it appears that the black rat is more abundant and widely distributed in Italy than in England. I know of some half-dozen specimens having been caught from time to time in the city of London, and in November, 1876, a male about six weeks old was caught, which lived in confinement for two years and three months. It was mated with a tame white one, and they had two litters of young which were black, save the feet, tip of tail, and a small brush of pure white upon the chest.

CHAS. COPPOCK

Grosvenor Road, Higbury New Park, July 11

Pine Pollen and Sulphur

BY a coincidence which depends upon the season of pollen-discharge occurring at the same period in Scotland as in England, I am enabled to send you an extract from the *Haddingtonshire Courier* of June 27, which may serve to dissipate the "sulphureous theories" of Mr. Carpenter's opponents.

"The rustics in this district [Gifford] have been of late much interested in a peculiar shower which had fallen in the early morning of Monday last. All the pools on the roads were covered and fringed with a powdery substance strongly resembling the flowers of sulphur. A calculating Good Templar found that the fiery powder had been drifted more about the houses of those who loved the flowing bowl than those who loved the

contents of the flowing river. One old woman, however, dispelled the Templar's idea by stating that she had felt the smell of 'brumstane' near her dwelling, and on searching the premises it was found the water-barrel had got a saffron cap on, and was otherwise dusted with the subtle powder. As this mystery, if it is not explained, may prove serious to the nervous, superstitious, or credulous part of the community we may as well add that at this season districts in the neighbourhood of fir plantations run the risk of a thorough dusting of this powder if there is the slightest breeze, as the cones of the young Scots fir are thickly coated with yellow powder or pollen, which will give out a blinding saffron cloud on the slightest irritation."

The laudable desire of our newspaper correspondent to relieve the anxieties of his neighbours at a time when the Presbyterian world is much exercised over the question of eternal and sulphureous punishment, can be fully appreciated only by natives. But in my opinion, the correspondent, in his clear knowledge of the nature of the "brimstone" deposit, exhibits a most praiseworthy tendency to explain the natural in terms of the natural; whilst the incident tends to show at the same time that there are not a few persons in this world to whom a course of elementary studies in natural history would serve as a means of culture, not to say of common protection against ludicrous mistakes such as those against which Mr. Carpenter inveighs. ANDREW WILSON

Edinburgh Medical School

Plague of Rats

I SEE by NATURE, vol. xx. p. 65, that Mr. Orville A. Derby contributes some very interesting information relating to a plague of rats in Brazil, and adding that the plague "is said to occur at intervals of about thirty years, and to be simultaneous with the drying of the *Taguara*, or bamboo, which everywhere abounds in the Brazilian forests." It may be interesting to know that a similar plague of rats visited the higher coffee districts of Ceylon during the year 1875, doing great damage to young and old plantations alike.

It is remarkable that the invasion of rats was simultaneous with the flowering and death of the *Nilloo* (*Strobilanthes*), which forms the greater part of the underwood of Ceylon forests, and is said to flower and die once every seven years. The most remarkable part of the plague was that the rats did not seem to devour any part of the branches they cut off, but to nip off and leave them untouched upon the ground. So serious indeed was the damage done, that on some coffee estates rewards were given to coolies for every rat they caught, and it was not an uncommon thing to hear of three or four hundred rats being destroyed, on *one* estate only, per week.

Between the years 1840 and 1850 there was a similar plague in the Kalebokka coffee district, where the damage done was immense, but I am not aware if it was so general as in the rat plague of 1875. It is to be hoped that we may not again be invaded in 1882, when the *Nilloo* is next expected to die.

Ballangoda, Ceylon, June 16 FREDERICK LEWIS

Glow-worms

SHELLEY sings of a "glow-worm golden in a dell of dew," but last night, at 10 o'clock, while travelling on a bridle path among the bleak lonely mountains of Tynron, Dumfriesshire, bearing up against a high wind with cold rain, I espied three glow-worms shining among the grass and ferns. I had seen them in the same locality before, but scarcely expected to have noticed them in such ungenial weather when summer has with us scarcely yet begun. J. S.

July 8

Headless Butterfly laying Eggs

ABOUT three o'clock on the 11th inst. I picked up a butterfly, probably belonging to the genus *Vanessa*. It was a female, the head of which had recently been plucked off by a bird, and was lying near the body. Thinking it was dead, I carried it home to examine the wing scales. On clipping off a bit of wing about four hours afterwards, the legs moved, and in a short time an egg was laid. In about two minutes another egg was laid. Others followed, till five-and-twenty had been expelled. Tremors of the legs and wings accompanied each deposit. The laying ceased, and the headless mother seemed dead. Next morning, on touching her, the motions of the legs and wings were repeated, and in a short time the laying was resumed. On close examination a heaving of the wings and rings of the abdomen could be observed, with about the frequency of human breathing. At the end of twenty-nine and a half hours from the time of finding, the laying ceased; seventy-eight eggs were laid by the butterfly with her head off. A. STEPHEN WILSON

North Kinmundy, Aberdeen, July 14

THE COMPARATIVE ANATOMY OF MAN[1]

III.

The Mongoloid People of Asia

TO the north and east of the line already spoken of, running northwards from the head of the Bay of Bengal to the north of the Caspian Sea, the bulk of the people of the Continent of Asia belong to the Mongolian, or better, Mongoloid type.

The physical characters of these people, best seen in the so-called Tartars who inhabit the country to the north of the great wall of China, are as follows: the complexion is pale brown, usually with a yellowish tinge; hence they are spoken of as the "yellow races," in contradistinction to the (so-called) white and black races. Their hair is black, perfectly straight, and coarse. In microscopic section it is seen to be of large size, and more inclining to cylindrical than in other races, but it varies much. Except on the scalp, where the hair is often long, the capillary development is very scanty. On the face it is often limited to two slender pencils on the upper lip; and the beard, when developed, is acquired comparatively late in life. The face is broad and flat; the space between the eyes is wide; the nose small, straight, and compressed; the eyes dark and small; the aperture between the lids narrow and somewhat oblique, being raised at the outer corner; the upper lid drooping, the inner corner partly covered by a vertical crescentic fold of skin; the cheeks very prominent; the mouth and lips of moderate size, the lower lip often hanging; the chin small and sharp.

The osteological characters of the typical Mongolian are more marked in the face than in the cranium, for the latter may vary between the extremes of brachycephaly and dolichocephaly, though the former prevails. The face is large, being both high and broad; the forehead flat, the glabella and superorbital ridges slightly developed; the orbits round, with thin sharp margins, the sub-glabellar nasal depression very slight; the nasal bones narrow and flat; the whole framework of the nose inclining to the leptorhine form; the jaws of medium prominence; the arch of the mouth broad and round; the malar bones both broad and deep. Perhaps the most distinctive feature of the Mongoloid face, which gives it the characteristic appearance, is the forward position of the outer margin of the orbit, as compared with the median line of the face. In order to estimate this character with exactness, Prof. Flower measures the angle formed between two horizontal lines meeting at the most depressed point of the nasal bones in the middle line (the apex of the angle) and resting on the middle of the outer margins of the orbit. This *nasi-malar* angle gives valuable average results. For instance, the average of 130 European skulls is 131 deg., of the twenty Maravars mentioned in the last abstract, exactly the same; of 20 African negroes 134 deg., and of 20 Australians 135 deg. In all of the true Mongolian races, the average exceeds 140 deg. Thus, in 4 Samoyedes it is 144 deg.; in 16 Chinese, 142 deg.; in 7 Japanese, 141 deg.; in 4 Burmese, 144 deg.; in 26 Eskimo, 144 deg.

The Mongoloid races of Asia are conveniently divided into two groups, the northern and the southern. The former, called Mongolo-Altaic races, are united by languages having considerable affinities. They nearly all lead a nomadic life, depending for their living on hunting, fish-

[1] Abstract of Prof. Flower's Hunterian Lectures, delivered at the Royal College of Surgeons, commencing on Wednesday, March 5. Continued from p. 246.